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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,771	12/12/2003	Michael Cornelis Van Beek	081468-0307031	8730
909	7590	05/25/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			GUTIERREZ, KEVIN C	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2851	

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/733,771	<b>Applicant(s)</b> VAN BEEK ET AL. 	
	<b>Examiner</b> Kevin Gutierrez	<b>Art Unit</b> 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12-12-03 & 5-6-04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: the reference number 5 on page 11, lines 2 and 7, are referring to two distinct references.

Appropriate correction is required.

### *Drawings*

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

- a. Figure 1, reference number 1
- b. Figures 2-9, reference number 4

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claim 7 is objected to because of the following informalities: "... said structure comprising a device that moves the component containing said surface..." fails to provide proper antecedent basis for the claimed subject matter (see underlined text). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 8-16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Somekh (6,427,703).

Regarding claims 1 and 14, Somekh teaches "a support structure (Fig. 2A, ref.#220) constructed to support a patterning structure (Fig. 2A, ref.#208), said patterning structure adapted to pattern a beam of radiation (Fig. 2A, ref.#203) according to a desired pattern; a substrate holder (Fig. 2A, ref.#212) constructed to hold a substrate (Fig. 2A, ref.#214); a projection system (Fig. 2A, ref.#210) customized and arranged to project the patterned beam onto a target portion of the

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substrate (Fig. 2A, ref.#214); a downstream radical source, connected to a gas supply (Fig. 2A, ref.#216), configured to provide a beam of radicals directed onto a surface to be cleaned (see col.7, lines 19-21).”

Regarding claim 2, Somekh teaches “wherein said beam of radicals contains substantially no ionized particles (see col. 6, lines 25-29).”

Regarding claim 3, Somekh teaches “wherein said gas supply (Fig. 2A, ref.#216), supplies at least one of oxygen, hydrogen, and fluorine (see Fig. 2A, ref.#216).”

Regarding claim 4, Somekh teaches “wherein said downstream radical source provides a beam of at least one of oxygen radicals, hydrogen radicals, and fluorine radicals (col. 6, lines 26-29).”

Regarding claim 5, Somekh teaches “wherein said surface to be cleaned is on one of the patterning structure, a sensor, a lens, a detector, and a reflector for reflecting one of the beam of radiation (Fig. 2A, ref.#203) and the patterned beam (see col. 9, line 43 and lines 49-50).”

Regarding claim 6, Somekh teaches “wherein the position of the downstream radical source is fixed (see Figure 2A, ref.# 216 is connected to illumination chamber (Fig. 2A, ref.#204) and chamber (Fig. 2A, ref.# 220) via nozzles (Fig. 2A, refs. #224 and 215).”

Regarding claim 8, Somekh teaches “wherein the downstream radical source comprises at least one of an RF coil, a pair of DC discharge electrodes, a microwave cavity, and an RF cavity that generates a region of plasma within the flow of gas from

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the gas supply, the radicals being created in said plasma region (see col. 6, lines 39-43).”

Regarding claim 9, Somekh teaches “wherein the downstream radical source comprises a high temperature element located within the flow of the gas from the gas supply, the temperature of the high temperature element being sufficient to cause thermal dissociation to create the radicals (see col. 6, lines 39-43).”

Regarding claim 10, Somekh teaches “an evacuated chamber (Fig. 2A, ref.# 220) that contains the patterning structure (Fig. 2A, ref.# 208), the substrate (Fig. 2A, ref.# 214), and the projection system (Fig. 2A, ref.# 210), wherein the downstream radical source comprises a tube (Figure 2C, ref.#235 and col. 7, lines 36-37), the beam of radicals are discharged from an end of said tube (Figure 2C, ref.#235 and col. 7, lines 36-37), and said end of the tube (Figure 2C, ref.#235 and col. 7, lines 36-37) is located in the evacuated chamber (Figure 2C, ref.#220).”

Regarding claim 11, Somekh teaches “wherein the region of the downstream radical source (Figure 2C, ref.#216) in which the radicals are formed is located outside of the evacuated chamber (see Figure 2C, ref.# 216 is located outside ref.#230).”

Regarding claim 12, Somekh teaches “wherein the apparatus comprises at least two downstream radical sources and corresponding beams of radicals for cleaning said surface (col. 10, lines 30-34).”

Regarding claims 13 and 20, Somekh teaches “wherein said surface to be cleaned comprises a surface of an optical element (see col. 3, lines 35-36).”

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Regarding claim 15, Somekh teaches the limitations set forth in claims 1 and 14. Somekh also further teaches “wherein said radical source (Fig. 2A, ref.#216) is disposed away from said radiation source (Fig. 2A, ref.#202) such that operating conditions of said radical source (Fig. 2A, ref.#216) do not adversely affect said beam of radiation (Fig. 2A, ref.#203).”

Regarding claim 16, Somekh teaches “a tube connected to the gas supply at one end (see Figure 2A, a tube connecting ref.#216 and ref.#224), and comprising an orifice (Fig. 2A, ref.#224) at an opposite end; and a plasma generator (col. 6, lines 38-41) to generate a plasma region, wherein gas from the gas supply (Fig. 2A, ref.#202) flows through the tube (Figure 2A) and through the plasma region such that neutral and ionized particles are created (col. 6, lines 26-29), and the beam of radicals exits the tube at the orifice (Fig. 2A, ref. 224) onto the surface to be cleaned (see col.7, lines 19-22).”

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6,427,703) in view of Horiike et al (5,308,791).

Somekh teaches “a structure to direct said beam of radicals onto a surface to be cleaned (see col.7, lines 19-22).” Somekh does not teach wherein “said structure comprising a device that moves the component containing said surface such that the beam of radicals is incident on said surface.”

However, having “said structure comprising a device that moves the component containing said surface such that the beam of radicals is incident on said surface” is routine in the art as is evident to the teaching of Horiike et al (col. 5, lines 6-7 and lines 15-18). It would have been obvious to one ordinary skilled in the art at the time the invention was made to modify Somekh by including a device to move the component containing the surface to be cleaned in the direction where the beam of radicals is incident on the surface.

The ordinary artisan would have been motivated to modify Somekh in a matter described above for at least the purpose to clean a specified portion of the surface.

8. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6,427,703) in view of Vane (6,105,589).

Somekh teaches the limitations set forth in claims except (claim 18) “wherein a Faraday grid neutralizes the ionized particles” and (claim 19) “wherein the Faraday grid is disposed at the orifice of the tube.”

However, having “wherein a Faraday grid neutralizes the ionized particles” and “wherein the Faraday grid is disposed at the orifice of the tube” is routine in the art as is evident to the teaching of Vane (col. 7, 62-65). Thus, it would have been



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obvious to one ordinary skilled in the art at the time the invention was made to modify Somekh by including a Faraday grid located at the opening of a tube to neutralizes ionized particles.

The ordinary artisan would have been motivated to modify Somekh for at least the purpose to provide a more uniform stream of neutralized ion particles.

9. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6,427,703) in view of view of Sakai et al (5,312,519).

Somekh teaches the limitations set forth in the claims except “wherein walls of the tube neutralize the ionized particles.”

However, having “wherein walls of the tube neutralize the ionized particles” is routine in the art as is evident to the teaching of Sakai et al (col. 2, lines 49-51). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify Somekh by including a discharge tube to neutralize the ionize particles.

The ordinary artisan would have been motivated to modify Somekh to utilize a discharge tube to provide a more uniform stream of neutralized ion particles.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Engelsberg (5,099,557) teaches an apparatus and method to remove contaminants from a substrate's surface without damaging or altering the

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surface structure. Irie (US 2001/0055104) teaches the removal of deposited film on a surface using oxygen plasma. Hase et al (US 2001/0028447) teaches a method of cleaning an optical element utilizing an ozone generator.

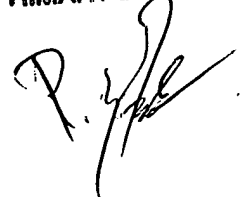
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Gutierrez  
Examiner  
Art Unit 2851

RODNEY FULLER  
PRIMARY EXAMINER



May 19, 2005